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ABSTRACT

This instructor's guide for a beef production unit contains five lessons that are designed to be taught in the Agricultural Science I core curriculum. Introductory materials include lists of performance objectives and competencies for the complete unit, suggestions for motivational technique/interest approach and evaluation, lists of references and materials for the unit, and a competency profile. Contents of each lesson include the objective, study questions, reference list, teaching procedures (with a content outline and answers to evaluation), and the evaluation instrument. Some lessons also contain transparency masters, handouts, and/or worksheets. Lesson topics are: selection of breeding stock, breeding and gestation, cow-calf management, backgrounding feeder cattle, and finishing feeder cattle. Instructors are encouraged to adapt these materials to the local area. (YLB)

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Beef Production
Beef Production
Beef Production
Beef Production
Unit

For
Agricultural Science I Core Curriculum

Instructor's Guide

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Instructor's Guide

BEEF PRODUCTION UNIT

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ACKNOWLEDGMENTS

A new addition to the Agricultural Science I curriculum, this Beef Production unit was developed according to suggestions made by the Teaching Aids Committee of the Missouri Vocational Agriculture Teachers Association. The format of these lessons and the accompanying student reference should aid teachers in lesson planning.

Several members of the University of Missouri-Columbia faculty deserve special thanks for their help in providing technical information, reviewing the material and offering suggestions. They are Dr. John Massey, Dr. Homer Sewell and Dr. Bonnard Moseley.

Special recognition is given to the Beef Advisory Committee members for providing their valuable time and suggestions in developing this unit. The Beef Advisory Committee consisted of Jim Bellis, Doug Carpenter, O. B. Clark, Vic Jacobs, Mike Moyer, Doug Stewart and John Wallace.

Special recognition is also due to Harley Schlichting, director, and his staff at the Instructional Materials Laboratory for the typing, editing and illustrating of this unit.

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FOREWORD

The Beef Production Unit is a valuable addition to the existing Agricultural Science I curriculum. A separate publication, "Student Reference in Beef Production," is available in class quantities for use with this unit.

Instructors should make every effort to adapt this material to the local area. In areas where cow-calf production predominates, teachers may elect to stress Lesson 1 (selection), Lesson 2 (breeding and gestation) and Lesson 3 (cow-calf management). In cattle feeding areas, teachers may wish to use Lesson 1 (selection), Lesson 4 (backgrounding) and Lesson 5 (cattle finishing).

During the summer of 1981, the Missouri State Board of Education formally adopted the concept of "Instructional Management Systems" (IMS) as a priority for the 1981-82 school year. Missouri Commissioner of Education Arthur L. Mallory has described the IMS concept as a practical way of "organizing for excellence" in education. To meet the demand for greater productivity and accountability, Dr. Frank Drake, Director of Vocational Education, applied the elements of IMS to form the "Vocational Instructional Management System" (VIMS). The VIMS process provides a framework to use in planning and organizing to assure excellence in Missouri's vocational educational system by focusing greater attention on the management of teaching and learning.

To aid vocational agriculture teachers in the implementation of VIMS, this guide incorporates the needed component parts to meet VIMS requirements. For ease of use, performance objectives and competencies have been included at the beginning of each unit, as well as being incorporated within each lesson. A competency profile has also been provided for convenient recordkeeping.

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AGRICULTURAL SCIENCE I

UNIT: BEEF PRODUCTION

LESSONS

1. Selection of Breeding Stock
2. Breeding and Gestation
3. Cow-Calf Management
4. Backgrounding Feeder Cattle
5. Finishing Feeder Cattle

OBJECTIVES

At the end of this unit, the student will be able to:

1. Select for purchase the correct type of beef cow or heifer for efficient production with 75% accuracy.*
2. Manage the breeding herd during breeding and gestation to achieve a 90% calving percentage.*
3. Manage and care for the cow and nursing calf to weaning age with 75% accuracy.*
4. Background feeder cattle to achieve economical weight gains with 75% accuracy.*
5. Finish feeder cattle for slaughter at an economical market weight with 75% accuracy.*

*NOTE: Percent of accuracy should be set by instructors to reflect passing grade within their school system.

COMPETENCIES

1. Combine production information and visual selection to choose superior beef animals.
2. Plan a program for managing a breeding herd during breeding and gestation.
3. Plan a program for managing a herd from calving through weaning.

4. Plan a management program for backgrounding calves for economical gains.

5. Describe how to finish cattle to an economical finishing weight.

MOTIVATIONAL TECHNIQUE OR INTEREST APPROACH

1. Compare the modern beef animal with the beef animal of 30 years ago. Discuss reasons why producers are raising different animals today.

2. Select a student who plans to have a beef supervised occupational experience program. Become thoroughly familiar with the student's situation. Use the student's program as an example so the class can understand real-life consequences of their decision-making.

3. Utilize a chapter beef project, a hypothetical situation or individual student projects to apply beef concepts to real-world situations.

REFERENCES AND MATERIALS

1. Student Reference for Beef Production (required). Available from Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211.

2. Teacher references

NOTE: These are suggested references and materials. This does not imply that they must all be used. Using only the required student reference should be sufficient to successfully teach this unit.

a) Texts

1) Bundy, Clarence E., and Ronald V. Diggins. Beef Production. Englewood Cliffs, NJ: Prentice-Hall, 1984.

2) Bundy, Clarence E., Ronald V. Diggins and Virgil W. Christensen. Livestock and Poultry Production. 4th ed. Englewood Cliffs, NJ: Prentice-Hall, 1975.

3) Ensminger, M. Eugene. Animal Science. 7th ed. Danville, Ill.: Interstate Printers and Publishers, Inc., 1977.

4) Gillespie, James R. Modern Livestock and Poultry Production. 2nd ed. Albany, NY: Delmar Publishers, 1983.

5) Taylor, Robert E. Beef Production and the Beef Industry: A Beef Producer's Perspective. Minneapolis, Minn.: Burgess Publishing Co., 1984.

b) Audiovisuals - Available from Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211.

1) Livestock Selection and Judging Kit. 24 slides/tape, AG-79-AV.
2) Standard and Exotic Breeds of Beef Bulls. 31 slides/script, AG-68-V.

EVALUATION

1. Give short, objective tests following each lesson and at the conclusion of the unit.

2. Look for evidence of student growth in ability to use the background acquired in earlier units to solve problems in these lessons.

3. Observe students' attempts to solve similar problems in their own supervised occupational experience programs.

MAJOR COMPETENCY PROFILE

Directions: Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:

3 **SKILLED** - can work independently with no supervision.
2 **MODERATELY SKILLED** - can perform job completely with limited supervision.
1 **LIMITED SKILL** - requires instruction and close supervision.
N **NO EXPOSURE** - no experience or knowledge in this area.

3	2	1	N

Beef Production

1. Combine production information and visual selection to choose superior beef animals.
2. Plan a program for managing a breeding herd during breeding and gestation.
3. Plan a program for managing a herd from calving through weaning.
4. Plan a management program for backgrounding calves for economical gains.
5. Describe how to finish cattle to an economical finishing weight.

Beef Production

Class/Section: _____

STUDENTS:	Combine production information and visual selection to choose superior beef animals	Plan a program for managing a breeding herd during breeding and gestation	Plan a program for managing a herd from calving through weaning	Plan a management program for backgrounding calves for economical gains	Describe how to finish cattle to an economical finishing weight	
12					10	

xv

UNIT - BEEF PRODUCTION

Lesson 1: Selection of Breeding Stock

Objective: The student will be able to select for purchase the correct type of beef cow or heifer for efficient production.

Study Questions

1. **What are the breeds of beef and what are the characteristics of each breed?**

2. **What guidelines should be followed when selecting cows and heifers?**

3. **What production characteristics are needed for efficient production?**

4. **What traits should be considered in visual selection?**

5. **How is production information combined with visual selection?**

References

1. Student Reference

2. Transparency Masters

   a) TM 1.1: Parts of a Beef Heifer
   b) TM 1.2: Desirable Heifer Traits

3. Work Sheet

   a) WS 1.1: Parts of a Beef Heifer

UNIT - BEEF PRODUCTION

Lesson 1: Selection of Breeding Stock

TEACHING PROCEDURES

A. Introduction

Introduce the unit.

B. Motivation

Call the students' attention to the importance of the beef industry to agriculture in the state, as outlined in the Foreword to the Student Reference. Ask the students to list traits they would want in their breeding stock. Then ask the students to list traits they do not want. Write all suggestions on the board and discuss any traits that appear in both lists.

C. Assignment

D. Supervised study

E. Discussion

1. Ask the student which breeds they would like to discuss, steering the discussion to breeds commonly raised in the area. Use flashcards or slides picturing the breeds for identification. Ask students to list breeds in their notebooks as they are identified and to include a discription of the breed and its origin. A chart could be drawn on the board to list the important information the students should learn.

What are the breeds of beef and what are the characteristics of each breed?

NOTE: Add to or delete from this list as needed.

a) British breeds

1) Angus - Black color and polled. Originated in Aberdeenshire and Angushire of Scotland. Imported into the United States in 1873 to cross with Longhorns.
2) Hereford - Red body with white face. Horned. Introduced in the U.S. in 1817 by Henry Clay.
3) Polled Hereford - Red body with white face and polled. Bred in 1901 in Iowa by Warren Gammon, who accumulated several naturally

polled cattle from horned Hereford herds.

4) Red Angus - Red color and polled. Founded as a performance breed in 1954 by sorting out genetic recessives from black Angus herds.

5) Shorthorn - Red, white or roan in color. Both horned and polled. Introduced into the U.S. in 1783 under the name "Durham." Most prominent in the U.S. around 1920.

b) Exotic breeds

1) Brahman - Various colors, with gray predominant. One of the Zebu breeds with the hump over the top of the shoulder; large, drooping ears; and excess skin in the throat and dewlap. Heat tolerant and well adapted to harsh conditions of Gulf Coast region. Major importations to the U.S. from India and Brazil. Largest introductions in early 1900s.

2) Charolais - White color. Heavy muscling; may be horned or polled. One of the oldest breeds in France. Brought to the U.S. soon after World War I; rapid expansion in the 1960s.

3) Chianina - White color with black eyes and nose. Extremely tall. An old breed originating in Italy. Acknowledged to be the largest breed.

4) Gelbvieh - Golden colored. Originated in Austria and West Germany. Developed as a dual-purpose breed (draft, milk and meat).

5) Limousin - Golden color. Marked expression of muscling. Introduced into the U.S. in 1969, primarily from France.

6) Maine-Anjou - Red and white spotted. A large breed developed in France and introduced into Canada in late 1968.

7) Simmental - Yellow to red-and-white color pattern. Both polled and horned. A prominent breed in parts of Switzerland and France. First bull arrived in Canada in 1967. Originally selected as a dual-purpose milk and meat breed.

c) Cross-derived breeds

1) Beefmaster - Various colors. Developed in the United States from Brahman, Hereford and Shorthorn breeds. Selected for its ability to reproduce, produce milk and grow under range conditions.

2) Brangus - Black and polled predominate; Red Brangus, also. Breed developed around 1912 in the U.S. to become three-eighths Brahman and five-eighths Angus.

3) Santa Gertrudis - Red color and horned. First U.S. breed of cattle; developed on the King Ranch in Texas. Combination of five-eighths Shorthorn and three-eighths Brahman.

2. Ask the students for some guidelines to follow when selecting cows and heifers.

What guidelines should be followed when selecting cows and heifers?

a) Replacements should come from top producing cows. Identify top cows on characteristics such as:
   1) Adjusted 205-day weaning weight
   2) Post-weaning performance of calves
   3) Disposition
   4) Femininity - can indicate fertility
b) Select only healthy animals that are free from disease. Females should be vaccinated and purchased from a common source if possible.
c) Begin the selection process at birth. Keep back more heifers for replacements than will eventually be needed to allow for culling.

3. Ask the students to identify production characteristics needed for efficient beef production. List these on the board as they are discussed, along with desirable standards.

What production characteristics are needed for efficient production?

a) Adjusted 205-day weaning weight
b) Adjusted 365-day (yearling) weight
c) Size of the loin eye area
d) Fat thickness over the loin eye between the 12th and 13th rib

4. Hand out WS 1 to the students. Show TM 1.1 to the students and ask them to identify the important parts of a beef heifer. Discuss briefly how each part is important. Show TM 1.2 and ask the students to identify important aspects of visual selection from side and rear views.

What traits should be considered in visual selection?

a) Parts of a beef animal (TM 1.1, WS 1.1)
b) Things to look for in visual selection
   1) From the side (TM 1.2)
      (a) Long, trim, deep-sided body
      (b) Trim through the brisket and both flanks

(c) Heavily muscled loin and round
(d) Proper height at the point of shoulder
(e) Walks freely
(f) Femininity
(g) Good bone structure, especially feet and legs
(h) Breed character (if a purebred)

2) From the rear
(a) Width through the center of the round
(b) Depth of the round
(c) Width between the rear legs

5. Ask the students which is more important in the selection process--production information or visual selection. Then ask the students how production information can be combined with visual appraisal in the process of selection.

How is production information combined with visual selection?

a) Keep production records.
b) Select for replacements only those heifers which meet satisfactory standards for both production information and visual selection.
c) Producers should use heritability estimates to help guide the selection process. Selecting for traits which have high heritability estimates will lead to more rapid genetic progress than selecting for traits with low heritability estimates.

F. Other activities

Other suggested activities include a field trip to visit a beef breeder who uses a good performance testing program and to gain practical experience in visual selection.

G. Conclusion

Selecting the right kind of breeding stock is important for genetic improvement in the beef industry. Important points to remember include:

1. Select replacement heifers that come from top producing cows.

2. Select heifers that meet minimum production efficiency standards as well as meeting the standards for visual appraisal.

3. Keep production records to aid the selection process.

H. Competency

Combine production information and visual selection to choose superior beef animals.

I. Answers to Evaluation

1. d
2. a
3. b
4. c
5. d

6. a. Adjusted 205-day weight
   b. Adjusted 365-day weight
   c. Size of the loin eye area
   d. Fat thickness between the 12th and 13th ribs

7. Visual traits and production records should be used and weighted in heritability for herd replacement selection.

J. Answers to work sheet

1. Poll
2. Eye
3. Face
4. Muzzle
5. Throat
6. Dewlap
7. Brisket
8. Forearm
9. Knee
10. Shank
11. Dewclaw
12. Flank
13. Hock
14. Switch
15. Round
16. Pin bones
17. Tailhead
18. Rump
19. Hip bone
20. Loin
21. Back
22. Shoulder
23. Belly
24. Ribs
25. Heart girth
26. Twist

Name _____

UNIT - BEEF PRODUCTION

Date _____

Lesson 1: Selection of Breeding Stock

EVALUATION

1. Circle the answer in the following that does not help to identify a beef breed.

   a. Where or how did the breed originate?
   b. What is the color or color pattern?
   c. Is the breed polled, horned or both?
   d. Does the animal deposit fat internally or externally?

Match the following definitions to the four selection characteristics. (one letter per blank)

   a. Indicates mothering ability
   b. Indicates individual's ability to gain weight
   c. Describes how the animal acts
   d. An appearance that can indicate fertility
   e. Describes the animal's amount of fat

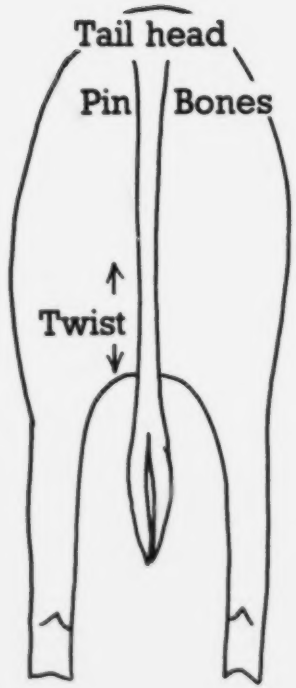
2. _____ Adjusted 205-day weaning weight
3. _____ Post-weaning performance of calves
4. _____ Disposition
5. _____ Femininity

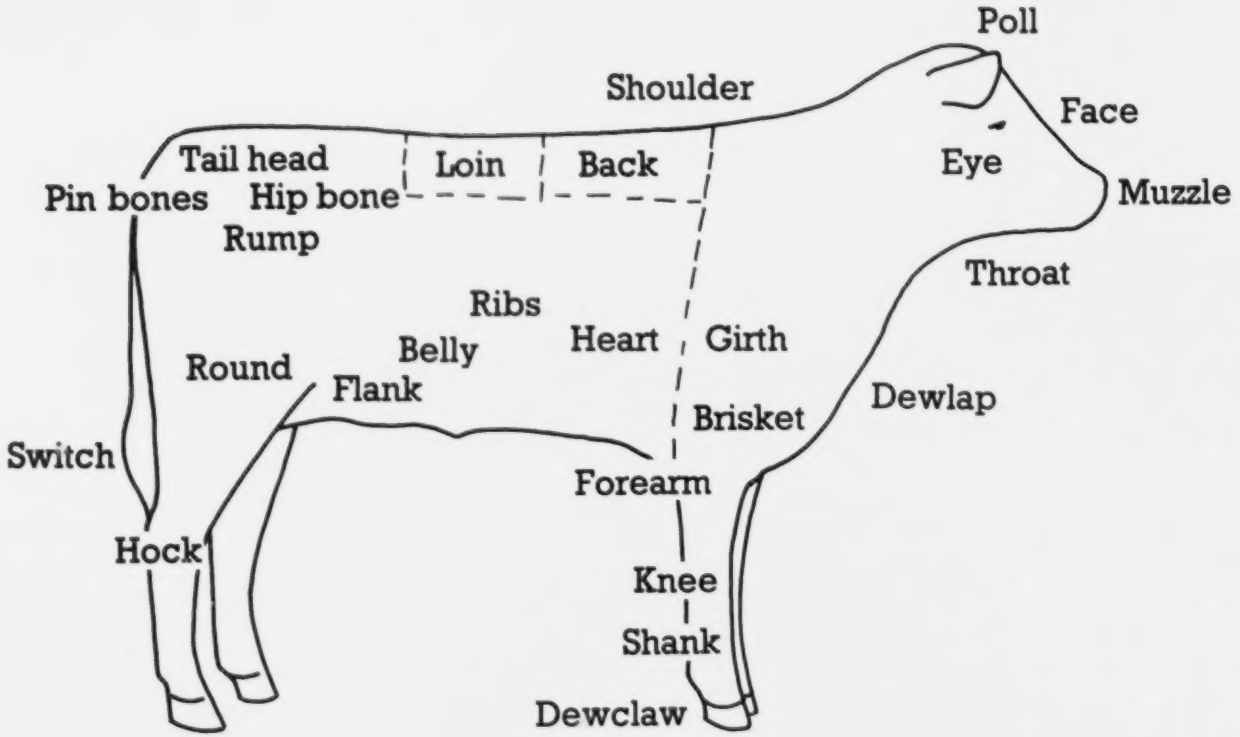
6. What are the four production characteristics for efficient beef production?

   a.
   b.
   c.
   d.

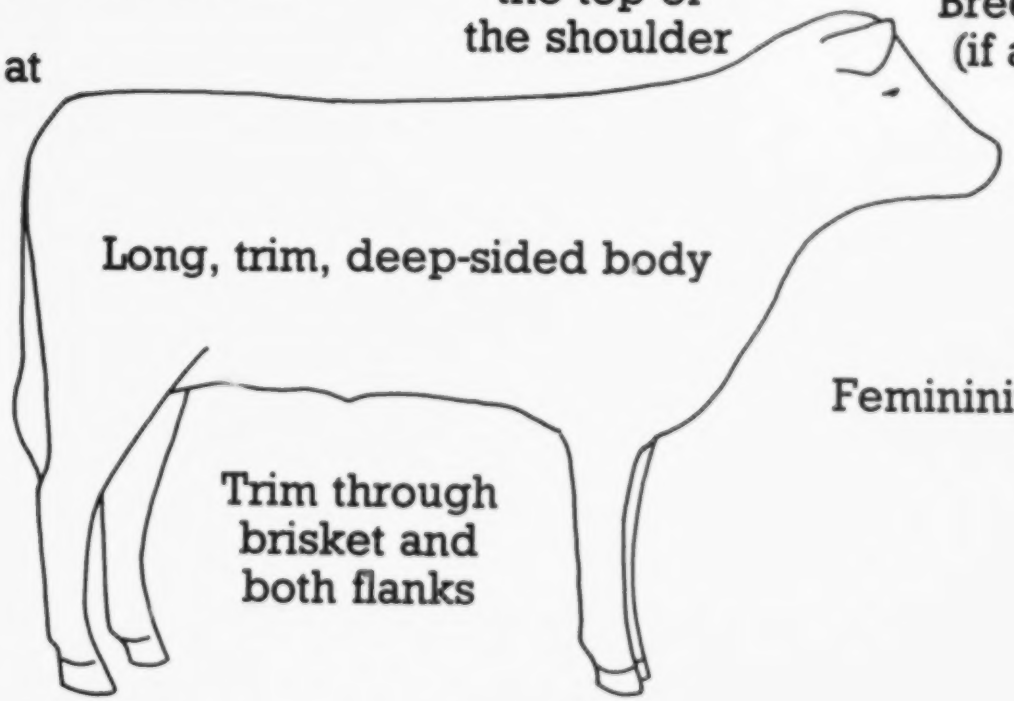
7. Describe how herd replacements should be chosen.

Parts of a Beef Heifer

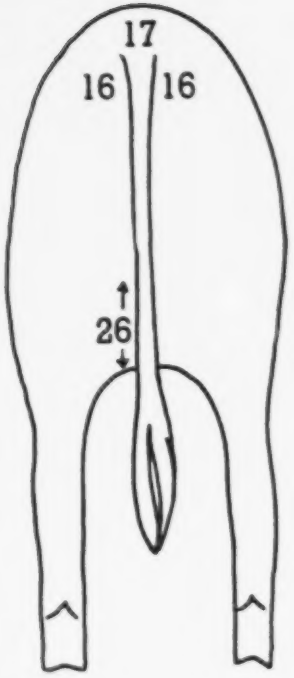


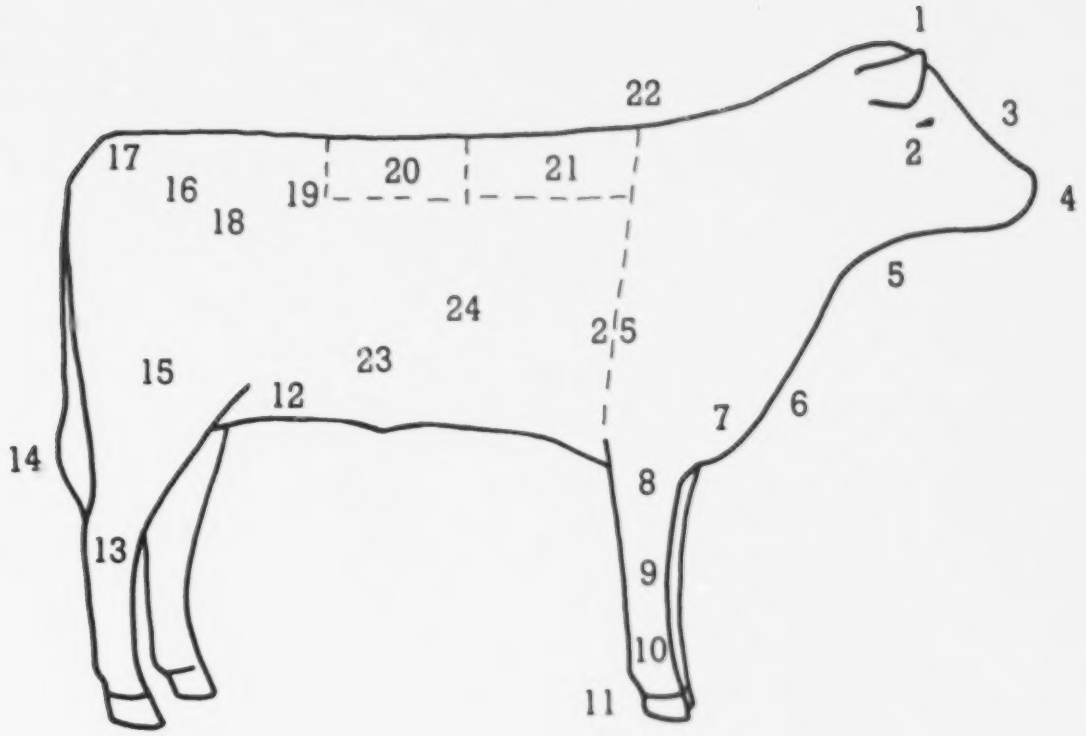


Desirable Heifer Traits


Heavily muscled loin and round
Proper height at the top of the shoulder
Breed character (if a purebred)
Proper height at the top of the hip
Long, trim, deep-sided body
Femininity
Walks freely
Trim through brisket and both flanks
Good bone structure, especially the feet and legs

Parts of a Beef Heifer





1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____

UNIT - BEEF PRODUCTION

Lesson 2: Breeding and Gestation

Objective: The student will be able to manage the breeding herd during breeding and gestation to achieve a 90% calving percentage.

Study Questions

1. **When should heifers be bred?**
2. **How should cows and heifers be fed during breeding and gestation?**
3. **What are some additional management tips for cows and heifers during breeding and gestation?**

References

1. Student Reference

UNIT - BEEF PRODUCTION

Lesson 2: Breeding and Gestation

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Ask the students what percentage of the beef cows in their herds calved last year. Then ask them whether these percentages were too low or too high. Ask them to speculate why the estimates were off.

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students when a heifer should be bred the first time.

When should heifers be bred?

a) Heifers should be bred at two years of age if they meet the following conditions.
   1) They have reached a standard weight.
      (a) 600-700 pounds for British breeds
      (b) 700-800 pounds for exotic breeds
   2) They have reached the standard weight by growth and <u>not</u> by fattening.

b) Heifers must be showing signs of their estrus period (heat).
   1) Early signs of heat
      (a) A small string of mucus dripping from a cow lying down usually means that the cow will be in heat in one or two days.
      (b) A heifer that is bawling repeatedly while the herdmates are quiet.
      (c) A female coming into heat is more alert and observant.
      (d) A cow that is standing while all the herdmates are lying down should be watched closely.
   2) Signs of standing heat
      (a) The cow may be seen sniffing like a bull does when checking cows.

(b) Some cows may attempt to ride cows that are in heat.
(c) A cow in heat will stand still while other cows mount her.
(d) A cow in heat may have mucus on the side of the tail or rump.

3) Signs of heat completion
(a) Matted hair coat, usually over the top of the shoulders, indicates the cow was in heat the night before.
(b) A cow that has just gone out of heat may have mud on her hips or some hair rubbed off.
(c) A cow that has just gone out of heat may be lying down while the herdmates are standing.
(d) A string of blood on the cow's tail or rump is a sign that the cow had been in heat 2-3 days earlier.

2. Ask the students what affects the amount and kind of feed for cows and heifers during breeding and gestation.

How should cows and heifers be fed during breeding and gestation?

a) The most critical need for energy for reproduction is during the last 60 days before calving and the first 90 days after calving.
b) Feed requirements during breeding and gestation will vary according to the size and condition of the cow or heifer and the time of year.
c) Underfed cows do not breed back as quickly as cows in good condition and may not breed back at all.
d) Conception rates will be increased if cows and heifers are gaining weight going into the breeding season.
e) Adequate amounts of energy, protein, vitamins (especially Vitamin A) and minerals (especially phosphorus) must be provided to cows and heifers during breeding and gestation.
f) Making good use of pasture and available roughages such as cornstalks and milo stubble are the key to keeping feed costs low.
g) Stockpiling fescue (letting the growth accumulate) can be used to provide late-season and winter pasture.
h) It is important to provide plenty of clean, fresh drinking water at all time.

3. Ask the students to identify some additional management tips during the breeding and gestation period. Ask them to determine approximate calving dates from various pasture breeding dates.

What are some additional management tips during breeding and gestation?

a) Obtain and prepare the bull for breeding at least 60 days before the breeding season; condition the bull by feeding 8-12 pounds of grain daily before the breeding season.
b) Make sure the bull is fertile. Have the bull examined by a veterinarian for breeding soundness before the breeding season starts.
c) Supply enough bulls for the herd. Yearling bulls can service 10-20 cows; 2-year-old bulls can service 25-30 cows; and mature bulls can service 30-40 cows.
d) Begin rebreeding cows 45-60 days after calving.
e) Establish a definite breeding season of 45-60 days, so that specific dates for the calving season can be established and calving is not spread over the year.
f) Pregnancy check all cows and heifers in the herd. A producer cannot afford to carry an open cow for a year without a calf being produced.
g) Start breeding heifers 30 days before breeding the cow herd and stop 30 days before the end of the cow breeding season.
h) Use regular blood testing, vaccination and sanitation programs to detect and prevent diseases.

F. Other activities

G. Conclusions

To manage the breeding herd during breeding and gestation for a 90% calving rate, a producer should:

1. Breed heifers to calve at two years of age.

2. Use the early calving system.

3. Feed adequate amounts of energy, protein, vitamins and minerals.

4. Follow other management tips such as preparing the bull for the breeding season, supplying enough bulls for the herd, establishing a definite breeding season and pregnancy checking all cows and heifers in the herd.

H. Competency

Plan a program for managing a breeding herd during breeding and gestation.

I. Answers to Evaluation

1. gaining
2. roughages
3. 2
4. 45, 60
5. weight

6. Any three of the following:
   a. cow sniffing like a bull
   b. cow being ridden by other cows
   c. cow that stands while being mounted.
   d. cow with mucus on the side of the tail or rump

7. A, phosphorus
8. 60
9. 45, 60
10. a

Name _____

UNIT - BEEF PRODUCTION Date _____

Lesson 2: Breeding and Gestation

EVALUATION

Short answer. Circle the correct answer or fill in the blank with the best answer.

1. A beef producer should manage the breeding herd so that the cows are (gaining, losing) weight going into the breeding season.

2. Making use of pasture and available _____ such as cornstalks and milo stubble is the key to keeping feed costs low.

3. A beef producer with a 50-cow herd should have _____ herd bulls if large mature bulls are used.

4. Rebreeding of cows should begin _____ to _____ days after calving.

5. Heifers should be bred when they reach a standard (age, weight) in their growth.

6. List three signs of a cow in standing heat.

   a.

   b.

   c.

7. Adequate amounts of Vitamin _____ and the mineral _____ must be provided to cows and heifers during breeding and gestation.

8. New herd bulls should arrive on the farm at least _____ days before the breeding season starts.

9. The breeding season should be _____ to _____ days long so that each cow can be bred twice.

10. All cows and heifers in the breeding herd should be pregnancy checked about 90 days after breeding. What should be done with those that are not bred?

    a. They should be culled from the herd immediately.
    b. They should be rebred immediately.
    c. They should be kept to rebreed next year.

UNIT - BEEF PRODUCTION

Lesson 3: Cow-Calf Management

Objective: The student will be able to manage and care for the cow and nursing calf to weaning age.

Study Questions

1. **What facilities and equipment are needed for a cow-calf production system?**
2. **What are some tips for managing cows at calving?**
3. **What management practices should be followed for calves to weaning?**
4. **How should the cow and calf be fed?**
5. **When should calves be creep fed?**
6. **How can diseases and parasites in beef cattle be controlled?**

References

1. Student Reference
2. Transparency Masters
   a) TM 3.1: Brand Locations
   b) TM 3.2: Drug Administration Sites for Beef Cattle

UNIT - BEEF PRODUCTION

Lesson 3: Cow-Calf Management

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Ask the students why cows may lose calves that are born healthy.

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what types of facilities are needed for cow-calf production. Ask the students what features are needed in cow-calf facilities.

What facilities and equipment are needed for a cow-calf production system?

a) Cow-calf systems need a minimum of facilities.
b) Trees or natural terrain can provide adequate shelter for most of the year.
c) Spring or fall calves can be born in a pasture.
d) Early calves will need some type of shelter for the first few days after calving, such as an open barn.
e) If available, separate areas should be used for wintering cows, first-calf heifers, bulls and calves.
f) A corral system with at least a holding pen, working chute and headgate will be required.
g) Clean, accessible water is needed at all times.

2. Ask the students for some tips on managing cows at calving.

What are some tips for managing cows at calving?

a) Have the facilities ready for calving.
b) Observe cows for signs of calving.
    1) Nervousness and restlessness
    2) More frequent urination

3) Loose muscles in the tail area
4) Milk production
5) Leaving the herd
6) Labor

c) Observe cows in labor for any problem signs.
   1) Cow is nervous: stands up and lies down often.
   2) Cow tries to deliver standing up.
   3) The position of the calf is abnormal.

d) Attend to the calf as soon as possible after birth.

e) Make sure the cow claims her calf and permits it to nurse.

f) If the cow fails to clean properly (12-18 hours after calving), contact a veterinarian.

g) Keep the cows that have calved separate from others when possible.

h) Watch for any signs of mastitis or udder injury.

i) Provide assistance if the calf is not born 45-60 minutes after the water breaks.

3. Ask the students to identify some additional management practices for calves up to weaning age. Show TM 3.1 to the students.

What management practices should be followed for calves to weaning?

a) Identify each calf at birth and record information for production records.

b) Castrate bull calves that are not to be kept for breeding purposes.

c) Dehorn all horned calves.

d) Permanently identify all cattle to help prevent theft. (TM 3.1) Ear notching may be used for local identification, but it is not considered legal identification.

e) Wean calves by six months of age.

4. Ask the students what affects the amount and kind of nutrients fed to lactating cows and calves to weaning.

How should the cow and calf be fed?

a) The first four months after calving is a critical period for the cow because it is the period of highest milk production.

b) Critical nutrients during lactation are energy, protein, vitamins (especially Vitamin A) and minerals (especially calcium, phosphorus, salt, cobalt, iodine and magnesium).

c) Feed requirements will vary for each cow according

to her size and condition and the time of year.

d) Making good use of pasture and available roughages is important for keeping feed costs low.

e) Provide plenty of clean, fresh water at all times.

5. Ask the students to define creep feeding. Then ask them when calves should be creep fed, when creep feeding would not pay and how calves are creep fed.

When should calves be creep fed?

a) Creep feeding is the feeding of concentrates to suckling calves to supplement mother's milk.

b) Creep feeding helps the producer in a number of situations.
   1) Where heavy weaning weights and extra bloom is desired in purebred herds
   2) When the fall calving system is used
   3) When pastures are poor
   4) During drought years
   5) When there are large numbers of first-calf heifers or cows over 11 years old in the herd
   6) When the herd has a history of poor milkers
   7) With steer calves
   8) When heavier feeder calves would sell for more per pound than lightweight feeders
   9) When grain prices are low in relation to feeder calf prices

c) In some situations, creep feeding is unlikely to pay off.
   1) When calves are to be pastured or wintered on roughage after weaning, before being finished
   2) When grain feeding will continue for more than 90 days after weaning
   3) When pasture is excellent for the cow herd throughout the summer
   4) When spring calves are to be sold as feeders in the fall

d) Calves that have been creep fed should gain 25-125 pounds (study results average 60 pounds of gain).

e) It will take 6-9 pounds of feed for every pound of additional weaning weight.

f) Locate the creep feeder near water or in the shade where cattle loaf frequently.

6. Ask the students to identify the goals of the beef herd health plan. Ask them to identify drug administration sites. Show TM 3.2 to the students. Ask the students how to control diseases and parasites in the beef herd.

How can diseases and parasites in beef cattle be controlled?

a) The primary goal of a beef herd health program is to produce a healthy calf during the birth to weaning period.
b) A secondary goal of the herd health program is to produce a calf that will survive and remain in good health during the feedlot period.
c) Proper administration of drugs and vaccines is important. (TM 3.2)
d) Following a systematic health program will help meet these goals.

F. Other activities

1. Consider a field trip to see beef cow-calf facilities.

2. Invite a local veterinarian to speak to the class about beef herd health would also be appropriate.

G. Conclusion

When managing cows and calves to weaning, a producer should:

1. Provide handling facilities, including at least a holding pen, working chute and a headgate.

2. Carefully observe cows at calving.

3. Identify each calf, castrate bull calves, dehorn and permanently identify each calf to prevent theft.

4. Feed adequately, especially in the first four months of lactation, and creep feed calves when profitable.

5. Follow a systematic herd health program.

H. Competency

Plan a program for managing a herd from calving through weaning.

I. Answers to Evaluation

1. Any three of the following:
   a. in purebred herds
   b. when fall calving is used
   c. when pastures are poor during the time when calves are nursing
   d. in drought years

e. in herds where there are large numbers of first-calf heifers or cows over 11 years of age
f. in a herd of poor milk-producing cows
g. for steer calves
h. when heavier feeders sell for more per pound than lightweight feeders
i. when grain prices are low in relation to feeder prices

2. elastrator, clamp

3. a. ear tag
b. tattoo
c. neck chain
d. ear notch

4. without
5. 12, 18

6. The calf needs the colostrum that is rich in nutrients and antibodies.

7. water
8. Creep feeding
9. 6
10. diseases, parasites

Name _____

UNIT - BEEF PRODUCTION Date _____

Lesson 3: Cow-Calf Management

EVALUATION

Give a short answer, fill in the blank or circle the best answer for each question.

1. List three instances when creep feeding calves will be profitable.

   a.

   b.

   c.

2. Incomplete castration is usually due to poor technique with the _____ or _____.

3. List the four methods of identifying calves.

   a.
   b.
   c.
   d.

4. Calves (with, without) horns are worth more when sold as feeders.

5. If the cow does not clean within _____ to _____ hours after giving birth, the veterinarian should be called to take care of it.

6. Explain briefly why calves should nurse as soon as possible after birth.

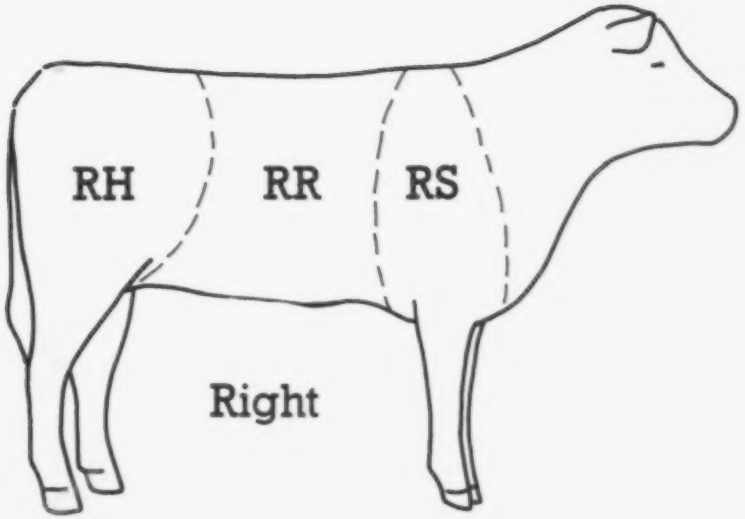
7. The cow and calf should have plenty of _____ available at all time.

8. _____ is the feeding of concentrates to suckling calves to supplement their mother's milk.

9. Feeder calves should be weaned by _____ months of age.

10. A beef producer should have a beef herd health program to control _____ and _____ in the cattle.

Brand Locations



RH - Right Hip
RR - Right Rib
RS - Right Shoulder

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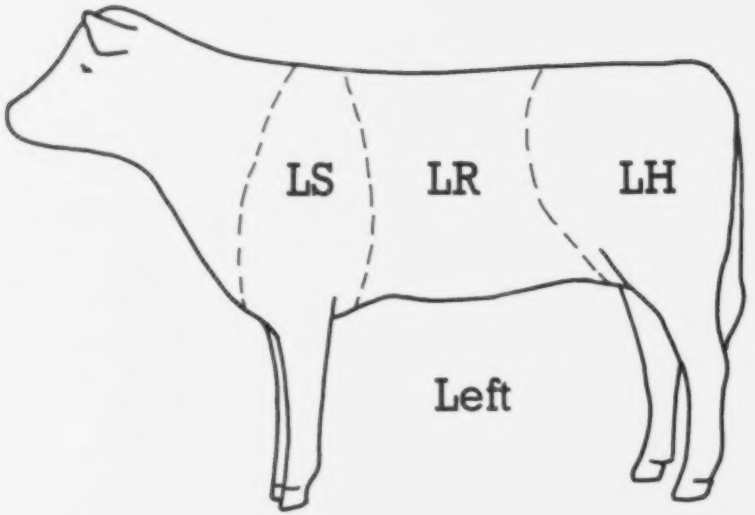

LS - Left Shoulder
LR - Left Rib
LH - Left Hip

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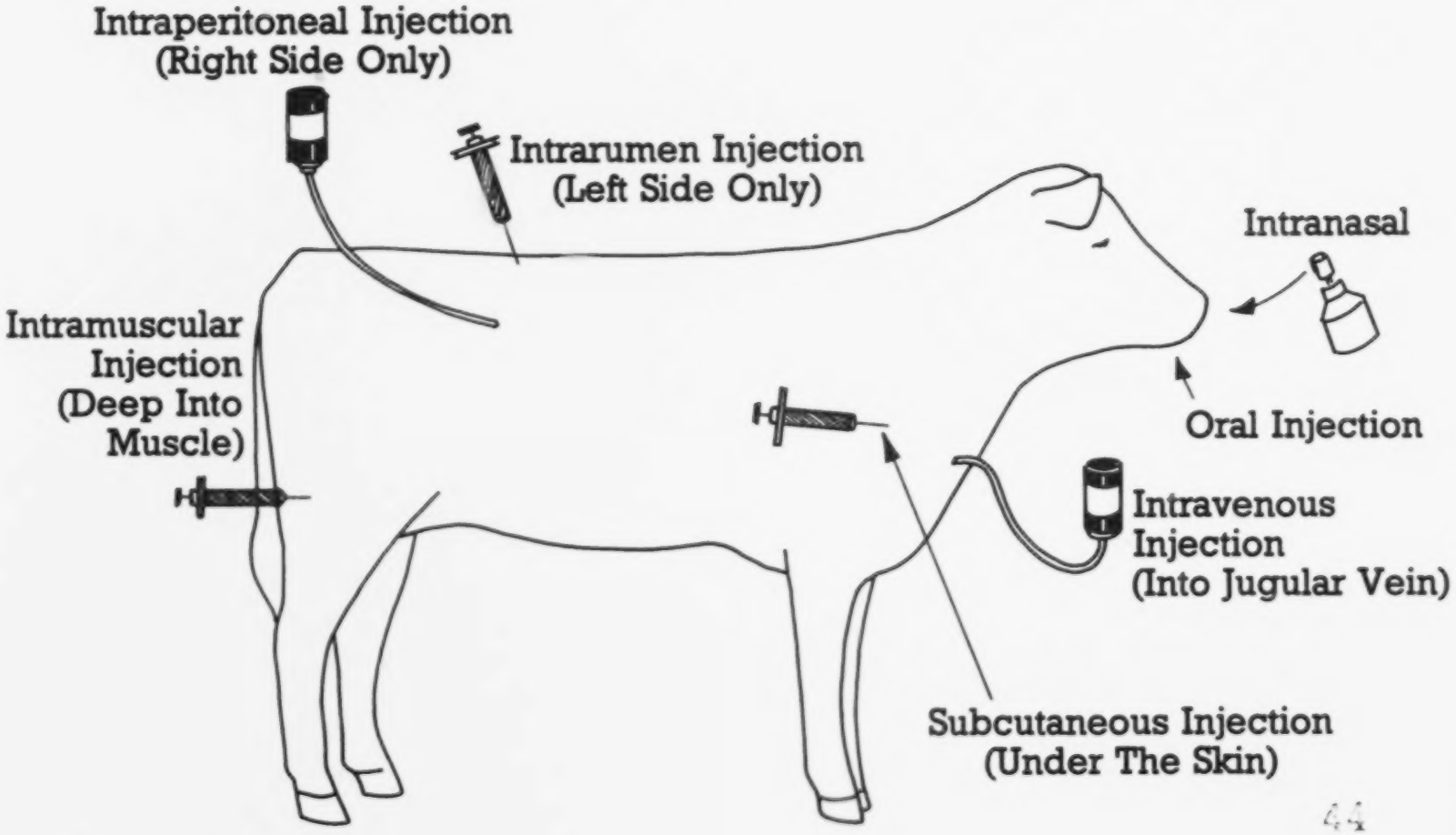
Drug Administration Sites For Beef Cattle



UNIT - BEEF PRODUCTION

Lesson 4: Backgrounding Feeder Cattle

Objective: The student will be able to background feeder cattle to achieve economical weight gains.

Study Questions

1. **What type of cattle should be purchased for a backgrounding program?**

2. **How should newly purchased feeder cattle be handled for backgrounding?**

3. **What kind of feeding program should be used when backgrounding?**

4. **What additional practices should be followed when backgrounding feeder cattle?**

References

1. Student Reference

2. Transparency Masters

   a) TM 4.1: USDA Grades of Feeder Steers
   b) TM 4.2: USDA Grades of Feeder Steers (Calves)

UNIT - BEEF PRODUCTION

Lesson 4: Backgrounding Feeder Cattle

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Ask the students how many feeder cattle are backgrounded in the area each summer and winter. Ask them why backgrounding is important in the area.

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what type of cattle they should purchase for a backgrounding program. Use TM 4.1 and TM 4.2 to discuss grades of beef animals to buy.

   What type of cattle should be purchased for a backgrounding program?

   a) Buying the right type of cattle for the right price is very important for a successful backgrounding program.
   b) Look for growthy, thin calves weighing 375-425 pounds (TM 4.1, TM 4.2) that will grade choice when fed out to market weight.
   c) Look for calves that are thin because of a lack of feed, not because they are unhealthy or genetically inferior.
   d) Look not only for the large lots but also for the singles, doubles and bull calves that are good buys.
   e) Buy preconditioned cattle when possible because they have been prepared for the stress of changing environments.
      1) These calves would have been weaned 30 days before marketing.
      2) Calves would have been adjusted to trough and bunk with appropriate medicated feed. These feeds are also sometimes recommended for preparing calves for weaning.

3) Calves would have been vaccinated for Clostridial group, Infectious Bovine Rhinotracheitis, Para-Influenza, and Pasteurella at least two weeks prior to movement.
4) If worms were a problem in the area, calves would have been dewormed with injectable, drench or feed-additive dewormer.
5) The calves would have been treated with an approved grubicide at least two weeks prior to shipment.
6) Calves must have been castrated by knife at least 30 days prior to shipment, but preferably when one month of age.
7) The calves must have been dehorned.
8) Calves should have been implanted with an approved implant.
9) The calves would be identified with an ear tag and should be accompanied by a certificate from a veterinarian.

2. Ask the students how they should handle newly purchased feeder cattle for backgrounding.

How should newly purchased feeder cattle be handled for backgrounding?

a) Calves which have recently arrived on the farm are under stress from being moved and are particularly susceptible to outbreaks of disease.
b) Isolate newly arrived calves from other cattle on the farm for 30 days.
c) Using a small pasture for the isolation lot will help the producer keep an eye on new arrivals.
d) Provide good quality hay, salt and plenty of fresh water in an area that is as dust-free as possible.
e) Include a wide spectrum antibiotic in the feed for the first month after arrival.
f) Provide any treatment that is needed when the calves arrive.
    1) Castrate bull calves.
    2) Dehorn (if needed).
    3) Vaccinate for Rednose.
    4) Vaccinate for Blackleg.
    5) Vaccinate for Shipping Fever.
    6) Treat for lice.
    7) Treat for worms.
g) Check the calves several times daily for any signs of sickness, such as a failure to eat, tired appearance, coughing or drooping head and ears.
h) Treat calves before they get very sick; consult a veterinarian for help.

3. Ask the students what kind of feeding program should be used for backgrounding.

What kind of feeding program should be used when backgrounding?

a) Summer grazing program
   1) There are two choices; which is best will depend on the year. Be flexible and figure the costs and returns before deciding.
      (a) Sell the calves in late July or August when pasture gains start to decline.
      (b) Give the calves supplementary feed to make up for the declining pasture, usually beginning in early July.
   2) Calves that are on grass-legume pastures, grass that has been fertilized with nitrogen and grass that is in the early stages of growth will probably not need supplemental protein.
   3) A grain mixture should supplement, but not replace, the pasture.
   4) The grain mixture should have a protein content of 6-10% crude protein.

b) Winter feeding
   1) The types of feeds and rates of gain strived for will depend on marketing strategy.
      (a) Retained ownership program: These animals would be fed for a 1.5-2.0 pounds per day gain. They do not experience later weight losses due to marketing stress and therefore should produce more economical gains.
      (b) Feeder calf program: These animals would be fed for a 1.00-1.25 pounds per day gain. Special attention should be given not to get these animals fat. Fat is more expensive to gain and worth less at market.
   2) A good quality grass should be provided as a roughage to help control scours for starting cattle on feed.
   3) Calves should be gradually placed on the grain ration by starting with two pounds of grain per day per head (along with free choice hay), gradually increasing the grain fed by one pound per head every two days until desired gains are reached.
   4) Salt can be used to limit the grain and protein intake of calves on grain so that a self feeder can be used.

4. Ask the students what additional practices they should follow when backgrounding feeder cattle.

What additional practices should be followed when backgrounding feeder cattle?

a) Weigh the calves during the feeding period to determine the weight gain progress of the calves.
b) Implant the calves for faster rates of gain.

F. Other activities

Other activities appropriate for this lesson would include field trips to work on newly arrived feeder cattle or to implant calves.

G. Conclusion

For a successful backgrounding program, a beef producer should:

1. Purchase thin, growthy calves for the right price.

2. Isolate and closely observe newly arrived calves for 30 days after they arrive.

3. Sell summer grazed calves when pasture gains start to decline or provide supplemental feed to offset the decline in pasture quality.

4. Feed calves backgrounded through the winter to be sold in the spring to gain 1.00-1.25 pounds per day.

5. Feed calves backgrounded through the winter (to be grazed the following summer) to gain 1.50-2.00 pounds per day.

H. Competency

Plan a management program for backgrounding calves for economical gains.

I. Answers to Evaluation

1. 30
2. Preconditioning

3. Any four of the following:
   a. weaned 30 days before market
   b. adjusted to feed in trough or bunk
   c. vaccinated two weeks before market
   d. dewormed

e. treated for external parasites two weeks before market
f. castrated 30 days before market
g. dehorned

4. Any two of the following:
   a. failure to eat
   b. tired appearance
   c. coughing
   d. drooping head and ears

5. 1.00, 1.25
6. implant
7. Salt
8. more, less
9. gradually
10. 375, 425, choice

Name _____

UNIT - BEEF PRODUCTION Date _____

Lesson 4: Backgrounding Feeder Cattle

EVALUATION

Give a short answer, fill in the blank or circle the best answer.

1. Newly purchased feeder cattle should be isolated from other cattle on the farm for the first _____ days after they arrive on the farm.

2. _____ is the process of preparing cattle for the stress of changing environments.

3. List four practices which should be performed on feeder cattle before marketing.

   a.

   b.

   c.

   d.

4. List two signs of sickness that a newly arrived feeder calf might show.

   a.

   b.

5. Calves to be backgrounded through the winter and sold in the spring should be fed to gain _____ to _____ pounds per day.

6. Calves that have an _____ placed under their skin should have a faster rate of gain.

7. _____ can be used to limit the grain and protein intake of calves so that a self-feeder can be used.

8. Fat is (more, less) expensive to gain and worth (more, less) at market.

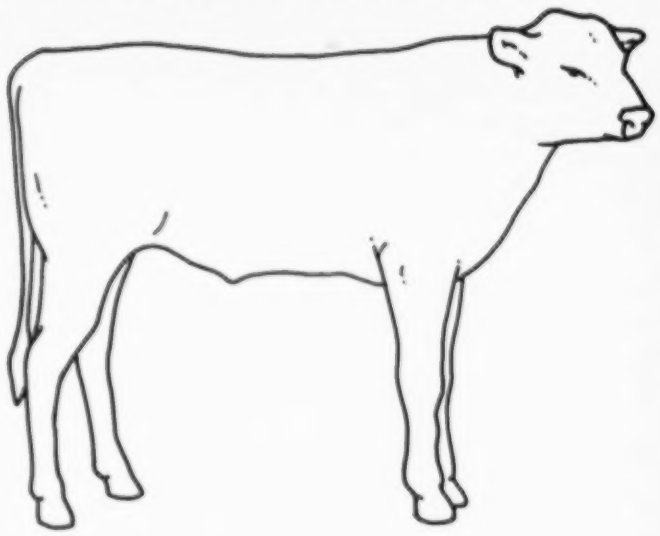
9. Calves should be (quickly, gradually) placed on a grain ration.

10. An ideal backgrounding calf will be growthy and thin, weighing _____ to _____ pounds and will grade _____ when fed to market weight.

USDA Grades of Feeder Steers

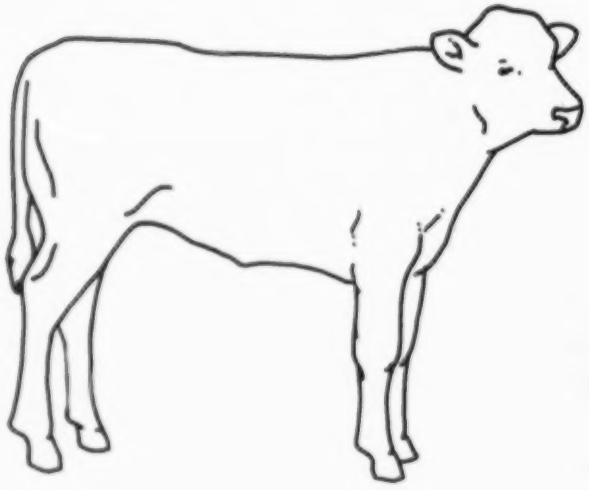
Large Frame

- Tall and long for age
- Half inch of fat
  Steers, 1200 lbs. or more
  Heifers, 1000 lbs. or more



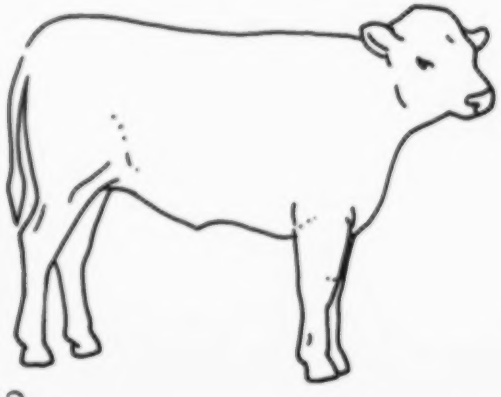
Medium Frame

- Slightly tall and slightly long for age
- Half inch of fat
  Steers, 1000-1200 lbs.
  Heifers, 850-1000 lbs.



Small Frame

- Small frame and shorter-bodied for age
- Half inch of fat
  Steers, less than 1000 lbs.
  Heifers, less than 850 lbs.



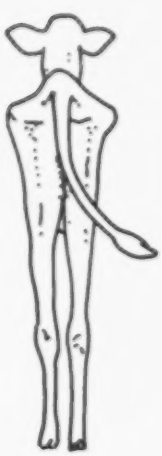
USDA Grades of Feeder Steers (calves)

No. 1

- Slightly thick throughout
- Moderate width between legs
- High proportion of beef breeding

No. 2

- Narrow throughout
- Legs set close together
- Back and loin have sunken appearance



No. 3

- Less thickness than No. 2
- Legs closer together than No. 2

UNIT - BEEF PRODUCTION

Lesson 5: Finishing Feeder Cattle

Objective: The student will be able to finish feeder cattle for slaughter at an economical market weight.

Study Questions

1. **How should newly purchased feeder cattle be handled?**
2. **What types of facilities are needed for finishing feeder cattle?**
3. **How should cattle be fed for finishing?**

References

1. Student Reference

UNIT - BEEF PRODUCTION

Lesson 5: Feeder Cattle

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Two farmers buy and sell feeder cattle under the same market conditions. One farmer's operation experiences good production; the second farmer's operation suffers from high death losses and slow gains. What could the first farmer be doing differently?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students how they should handle newly purchased feeder cattle.

How should newly purchased feeder cattle be handled?

a) Managing newly purchased arrivals
   1) Have the facilities ready before the cattle arrive.
      (a) Clean and repair the lot and equipment.
      (b) Repair fences.
      (c) Fill in mudholes.
      (d) Remove any wire, stones and other objects from the lot.
   2) Provide unloading facilities and chutes so that the cattle can be handled with as little stress as possible.
   3) Provide a small lot for treatment and isolation of sick animals.
   4) Keep cattle from different farms separate as much as possible.
   5) Observe the cattle frequently, watching for those that fail to eat, appear tired or show other signs of illness.
   6) Move sick animals to the sick pen for diagnosis and possible treatment.

b) Vaccinations, medication, parasite control
   1) Consult a local veterinarian for advice on a vaccination program.
   2) Vary the vaccination program according to the vaccinations given to the cattle prior to purchase.
   3) Vaccinate at the time of arrival if the cattle are healthy; delay vaccination if the cattle are sick or extremely stressed.
   4) Worm cattle at the first opportunity; this can be done whenever the cattle are run through a chute.
   5) Control lice and grubs.

c) Water
   1) Use shallow pens or put a temporary fence across the lot to keep new arrivals close to feed bunks and water supplies.
   2) Force extremely stressed or dehydrated cattle to eat first by keeping them away from water for about five hours after arrival. This will build up energy supplies.
   3) Stock tanks may be needed for the first few days to provide water for cattle not used to drinking from automatic waterers.
   4) Sick animals may be treated easier the first few days by providing antibiotics and vitamins in the water.
   5) For cattle that are badly dehydrated in transit, provide electrolytes in the water to speed recovery.

d) Starting cattle on feed
   1) Use a palatable roughage, such as good quality grass hay or first cutting alfalfa-brome hay.
   2) Spraying molasses over roughages will encourage the cattle to eat.
   3) Corn silage supplemented with protein can be used to start the cattle on feed.
   4) Cattle that are not used to a grain ration should be started on grain gradually.
      (a) Start with 1-2 pounds of coarsely ground corn or oats per head mixed with, or spread over, the roughage in the bunk.
      (b) About 1/2 pound of the concentrate should be soybean meal (or its equivalent) Use plant proteins like soybean meal in preference to urea the first three weeks. The ration's protein level should be 12-14%.
      (c) Increase the grain fed by one pound per day until the amount of grain fed reaches a level of one pound per hundred

pounds of live weight. Then increase the grain fed by 1/2 pound per day as the cattle clean up the previous feeding. Provide roughage free choice.

(d) Supply extra Vitamin A mixed into the ration or in a free-choice mineral mix for the first three weeks.

(e) Include a broad spectrum antibiotic in the feed for the first three or four weeks.

(f) Supply a trace mineral mix of 60% dicalcium phosphate and 40% trace mineralized salt.

2. Ask the students what types of facilities are needed for finishing feeder cattle.

What types of facilities are needed for finishing feeder cattle?

a) Pens and fences
   1) Lots should be large enough to provide adequate space for the cattle.
   2) Muddy lots will be a problem, causing price discounts when the cattle are sold. Build mounds in the pens to help ease the situation.
   3) Fences should be built stout enough to restrain the cattle. Combinations of barbed wire and electric fences may be used to keep fence costs low.

b) Feeding facilities
   1) Provide adequate bunk space for each animal.
   2) Provide enough waterers for the cattle--one waterer will service 40 head.
   3) Plan the feeding system so that all feeding operations can be done without opening a gate.
   4) Plan the feed storage, processing and feeding facilities to minimize labor needed.

c) Pollution control facilities
   1) Every feedlot system should be constructed to prevent air or water pollution from feedlot runoff.
   2) Pollution control will be different for every feedlot location.
   3) Selection of the feedlot site is very important in minimizing potential pollution problems.

4) There are six important items to consider.
   (a) Topography and soil properties at the site
   (b) Air movement
   (c) Size of the feedlot
   (d) Visibility of the feedlot and distance from neighbors
   (e) Distances from wells and streams
   (f) Possible location for a soil-plant filter

d) Handling and holding facilities
   1) There are six areas of minimum facilities.
      (a) A holding pen with 30 square feet of space per head capacity
      (b) A crowding pen, 150 square feet
      (c) A working chute, 18-30 feet long
      (d) A headgate
      (e) A loading chute
      (f) Sick pens
   2) Other features are also useful.
      (a) Additional holding pens
      (b) Blocking gates
      (c) Cutting gates
      (d) A squeeze chute
      (e) A set of scales
   3) All of these facilities should be planned so that each pen has access to the handling facilities, holding pens, sick pens, etc.

3. Ask the students how feeder cattle should be fed for finishing. Ask them to determine the better feed price for various grain prices.

How should feeder cattle be fed for finishing?

a) Choosing a high-energy ration or a lower-energy one will depend on the relative cost of the grain and roughage and the nutritive value of each.
b) A higher percentage of protein is needed for high-energy rations because fewer pounds are consumed by the animal each day.
c) Urea or nonprotein nitrogen may be substituted for up to half of the ration's protein source in low-energy rations; it may also be used to supply all of the protein in a high-energy ration.
d) The most important minerals in the ration are calcium, phosphorus and salt.
e) It is important to provide adequate amounts of Vitamins A, D and E. If animals are exposed to sunlight, adding Vitamin D will not be necessary. Most Missouri feedlot rations supply adequate Vitamin E.

f) Some feed additives increase rate of gain or feed efficiency.
   1) Synovex--a sex-specific implant; has improved rate of gain 10-14% and feed efficiency 8-10% in college trials.
   2) Ralgro--an implant; has increased rate of gain an average 10% and feed conversion 7% in feeding trials.
   3) Melengestrol Acetate (MGA)--an implant for feedlot heifers which suppresses heat; has improved rate of gain an average of 10.3% and feed efficiency 6.5% in trials.
   4) Rumensin--a feed additive; has improved feed conversion of feedlot cattle by 10%; has reduced feed intake with little change in rate-of-gain for cattle on high-energy rations; has improved feed efficiency about 15% for cattle on pasture or high-roughage rations.
   5) Antibiotics--feed additives; generally increase feed efficiency and rate-of-gain by 3-5%.

g) When using feed additives and implants, always follow label directions for the number of days prior to slaughter that drugs and additives should be withdrawn.

F. Other activities

1. A field trip to a local feedlot could help students examine handling and feeding facilities.

2. Inviting a veterinarian to speak to the class about handling newly arrived feeder cattle is also appropriate.

G. Conclusion

To finish feeder cattle economically, a producer should:

1. Feed out heifers if the price for the feeder heifers is low enough and if the heifers can be managed to suppress heat.

2. Handle newly arrived feeders to reduce death losses by having the facilities ready for the cattle; following a vaccination, medication, and parasite control program; making sure that the new arrivals drink adequate amounts of water; and starting the cattle on feed.

3. Provide adequate handling and holding facilities.

4. Feed an adequate high- or low-energy ration.

H. Competency

Describe how to finish cattle to an economical finishing weight.

I. Answers to Evaluation

1. grain, roughage
2. Steers
3. lower

4. Either of these:
   a. failure to eat
   b. tired and droopy appearance

5. gradually

6. Any four of the following:
   a. a holding pen
   b. a crowding pen
   c. a working chute
   d. a loading chute
   e. a headgate
   f. sick pens

7. lower
8. increase
9. dehydrated
10. urea

Name _____

UNIT - BEEF PRODUCTION

Date _____

Lesson 5: Feeder Cattle

EVALUATION

Give a short answer, fill in the blank or circle the best answer.

1. Whether a high-energy or low-energy ration is used for finishing will depend on the relative cost of _____ and _____ used.

2. (Heifers, Steers) gain faster and more efficiently in the feedlot.

3. When the corn price is $3.10 per bushel, milo is a better buy if it is priced (higher, lower) than $4.97 per hundredweight. (See chart below)

If corn price per bu. is:	Oats/bu.	Barley/bu.	Grain sorghum/cwt.	Wheat/bu.
2.90	1.48	2.35	4.65	3.19
3.00	1.53	2.43	4.81	3.30
3.10	1.58	2.51	4.97	3.41
3.20	1.63	2.59	5.14	3.52
3.30	1.68	2.67	5.30	3.63

4. One sign that cattle are becoming sick is _____ .

5. After they get to the feedlot, cattle should be started on a full-feed grain ration (gradually, as soon as possible).

6. Name four of the minimum components of a cattle handling system.

   a.

   b.

   c.

   d.

7. Muddy cattle receive a (higher, lower) price than cattle that are not muddy.

8. Feed additives and implants (increase, decrease) the rate of gain and/or the feed efficiency of feedlot cattle.

9. Badly _____ cattle should be forced to eat for the build-up of energy supplies <u>before</u> they are allowed water.

10. Nonprotein nitrogen or _____ may be substituted for a part of a ration's protein.

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